Algebra and Geometry 1. Homework 4.

Algebra.

1. Write the following expressions in a shorter way replacing product with power:
   Examples:
   $(-a)\cdot(-a)\cdot(-a)\cdot(-a)=(-a)^4$, $\quad 3m\cdot m\cdot m\cdot 2k\cdot k\cdot k=6m^3k^4$

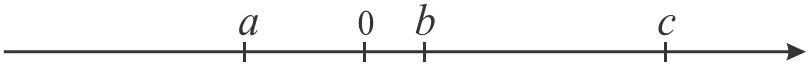
   $(-y)\cdot(-y)\cdot(-y)\cdot(-y)$;
   $-y\cdot y\cdot y\cdot y$;
   $(ab)\cdot(ab)\cdot(ab)\cdot(ab)\cdot(ab)\cdot(ab)$;
   $a\cdot b\cdot b\cdot b\cdot b$;
   $(-5m)(-5m)\cdot 2n\cdot 2n\cdot 2n$;
   $-5m\cdot m\cdot 2n\cdot n\cdot n$;
   $p-q\cdot q\cdot q\cdot q\cdot q$;
   $(p-q)\cdot(p-q)\cdot(p-q)\cdot(p-q)$;

2. Write the following expressions replacing exponent with a product of several factors:
   Examples: $(-x)^3=(-x)\cdot(-x)\cdot(-x)$; $\quad 3y-a^4=3y-a\cdot a\cdot a\cdot a$

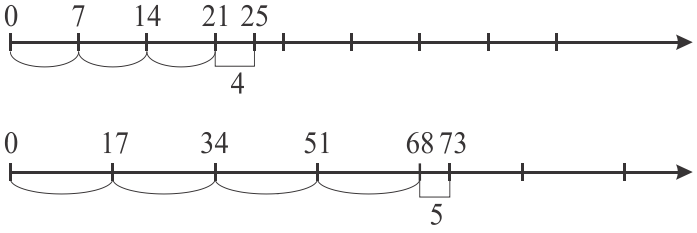
   $(-n)^3$;
   $-x^2$;
   $(2c)^2$;
   $(-mn)^4$
   $-mn^4$
   $2c^2$;
   $2x-y^3$
   $(a+3b)^2$
   $(2x-y)^3$

3. On a number line below points a, b, c are marked. Which of the following statements is false and which are true?

   a) $a+c>0$ $\quad b)\ a-b<0$, $\quad c)\ a+b>0$, $\quad d)\ abc<0$



4. Mary and Jenny have 11 pieces of candy, Jenny and Lisa have 13 pieces of candy and Mary and Lisa have 12 pieces of candy. How many candies they have altogether?
5. Using the pictures below, find dividend, devisor, quotient, and remainder. Write them in the form $a = b\cdot c + r$ $(r < c)$ (a is a dividend, b is a divisor, c is a quotient), explain your answer.



6. Simplify the following fractions:

$$\frac{a^3\cdot b^7}{a^2b^6} \qquad \frac{(a\cdot b)^5\cdot x^{10}}{a^2\cdot b^3\cdot x^7}$$

7. Set A = {2, 5, 6, 8, 12, 19, 24, 32, 45, 47}.

   Write subsets of the set A

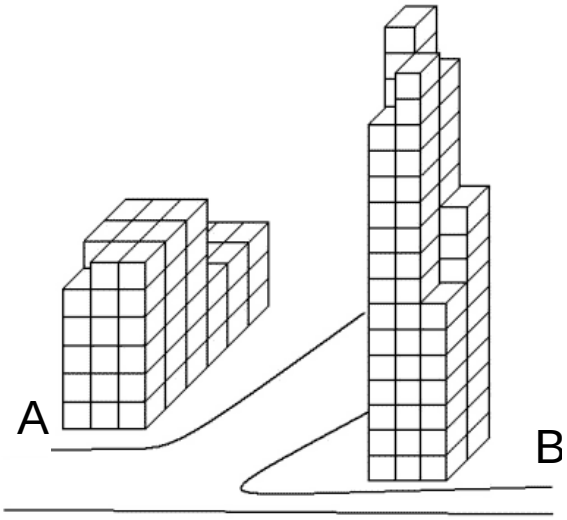
   a. prime numbers
   b. composite numbers
   c. divisors of 24
   d. not multiples of 2
   e. multiples of 3 and 5
   f. multiples of 3 or multiples of 5
   g. divisors of 8 or 12
   h. divisors of 8 and 12

8. Nine 1-digit numbers (1, 2, 3, 4, 5, 6, 7, 8, 9) should be placed into the boxes so that all equalities hold.

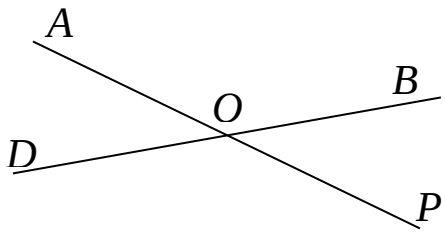
$$\square - \square = \square\square : \square = 3 + \square = 1 \cdot \square$$

Geometry: .

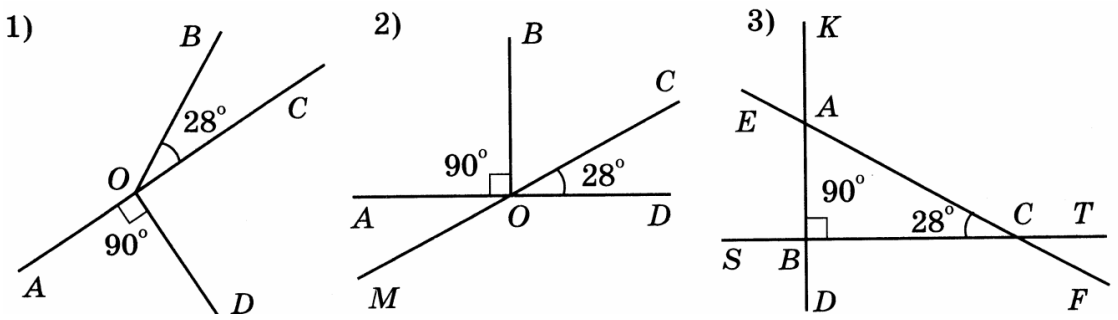
9. On a picture there are two buildings. Each small block is an apartment (including blocks inside the buildings). Which building can accommodate more families?



10. Write all vertical and supplementary angles shown on the picture below:



11. Find the measures for all angles on the picture below:



12. Draw two supplementary angles to each angle below, what is the measure of the supplementary angles?